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ABSTRACT

This study defines efficacy for teachers as a teacher's sense of ability to function as an instructional leader in the classroom, and knowledge of, and contribution to, school instructional policy. A brief review of two previous studies indicates that school policies and the mission of the school tend to affect teachers' beliefs about their competence as teachers, and that the influence of school policy on efficacy may be indirect. It is hypothesized that a teacher's sense of efficacy is directly affected by perception of control over instruction in the classroom, indirectly affected by faculty influence on school instructional policy, and directly affected by perception of student ability to learn. The data used in the study were from the High School and Beyond Program, specifically the Administrators-Teacher Survey (ATS) distributed in 1984. The sample for analysis consisted of 6,173 teachers in 315 schools. Variable measures are described and the methodology used to analyze the resulting data is explained. Results indicated that teacher efficacy is affected by teacher beliefs about students' ability to learn, faculty influence over school policy, and faculty beliefs about student behavior. Teacher efficacy also appeared to be related to the degree teachers are involved in decisions regarding curriculum and student grouping for instruction. (JD)

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The Relation of the School Environment to Teacher Efficacy

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The Relation of the School Environment to Teacher Efficacy

The focus of this paper is on how various aspects of an environment affect a person's sense of efficacy for accomplishing a particular set of tasks. Specifically, the paper deals with how the school environment (other teachers, school administrators, students) may affect a teacher's sense of efficacy as an instructional leader in the classroom.

Background

Social Cognition and the Environment

In his discussion of social cognition, Bandura (1977) differentiated between efficacy expectations and outcome expectations. Efficacy expectations are defined as a person's beliefs about their capability to perform specific behaviors. Outcome expectations are defined as a person's perceptions about the likelihood of a given behavior being able to produce a specific outcome. Bandura indicates that one factor in determining efficacy was situational circumstances, or the feedback a person receives as they try to accomplish a specific outcome. Although the effect of this information is dependent on what the results are attributed to, the role of situational circumstances suggests a possibility of outcome expectations providing feedback to efficacy expectations.

Teacher Efficacy and the Environment

In defining efficacy for teachers, the focus will be on a teacher's sense they can help their students to learn the assigned curriculum. In this sense, a teacher's sense of efficacy is defined with respect to a teacher's role as instructional leader in a classroom, rather than the other duties of a teacher.

The environment of a teacher is complicated and consequently hard to define. Indeed, the complexity can be seen when we look at what a teacher should know in order to function. Shulman (1987) suggests teacher knowledge can be categorized into seven groups. Although most of these groups refer to some aspect of pedagogy, two of the categories may be considered as knowledge of the environment. One category is knowledge of educational contexts, such as the school. Although much of the school context focuses on administrative tasks, the focus here will be on a teacher's knowledge of, and contribution to, school instructional policy. In a sense, efficacy with respect to the school environment is what Fuller, Wood, Rapoport, and Dornbusch (1982) define as organizational efficacy, or a person's capability of influencing another level of an organization.

The other category of interest is knowledge of learners and their characteristics. The relevance of the two categories with respect to efficacy can be seen from several studies.

Efficacy and school policy. Work by McShane and Pinfield (1986) focussed on how a district's policy options regarding staff

reduction would affect teacher perceptions of change in staff demographics and school effectiveness. Although the two policy options were regarded by the district as being substantially different, the teachers viewed the results of each policy as similar. Interesting results were that teachers believed that staff reduction would lower the quality of graduating students, decrease teacher commitment to students, and increase teacher burnout. The authors compared the results of the teachers' responses with a simulation program and found that teacher responses were more pessimistic. The authors hypothesize that these results may have been a function of the teachers' sense that the policies were being thrust upon them without any opportunity for input. (Similar policy implementations were occurring at the time of the study, and were also occurring without teacher input.)

While the majority of the results of McShane and Pinfield's study could be interpreted in terms of teachers' perceptions of control the finding that teachers believed the quality of graduates would decrease may suggest change in teacher efficacy. For example if a teacher believes he/she is a good teacher (high sense of efficacy) when the class size is less than 25, the teacher will tend to feel less competent (decreasing sense of efficacy) if the class size exceeds 25. The reason for this change in efficacy would be that teacher knowledge may be tied to specific factors, such as a particular track or student ethnic

population. To the degree a teacher's knowledge can be applied to a given situation he/she will believe they are competent. Consequently if teachers perceives any change in the environment then their sense of efficacy may decrease.

In an ethnographic study of two middle-level schools with different school missions, Ashton and Webb (1986) found differences in what teachers perceived as their jobs. In the multi-level school where teachers taught as teams, and each team was assigned a particular group of students, teachers perceived their role as helping the students develop as people. This whole-person approach was future encouraged by teams working with the same group of students over a three-year period. In contrast to the beliefs of teachers in this middle school were the role perceptions of teachers in a traditional junior high school which focussed more on subject area specialty. Being subject-centered the teachers were more concerned with conveying a particular concept than getting involved in the lives of students. The contrast in perceptions of teachers in the two schools suggests the nature of school policy (student- versus subject-focus) affects teachers' perceptions of their role. The degree to which teachers believe they can accomplish the designated role affects their sense of efficacy. Therefore school policy may affect teachers' sense of efficacy by varying their perceptions of role.

Whereas the previous examples were somewhat negative, Metz (1986) reported about one school with positive teacher attitudes associated with teacher control. The teachers at Adams Avenue School (a fictitious name used by Metz) were given the freedom to plan the curriculum of the school. Metz found the teachers at the school believed they were good teachers and could teach students regardless of their background. The latter is somewhat surprising because some of the students at Adams Avenue came from relatively poor conditions. Other research indicates teachers at low-SES schools tend to be frustrated (Anyon, 1982). The teachers at Adams, as indicated by a discussion in a teachers' meeting, did not seem to care what type of background the children came from or the type of activities the students participated in when they went home, but only dealt with how best to adapt instruction to help each child learn. In other words the amount of influence the teachers had over school instructional policy affected their belief about their own competence as teachers and how much influence they had over student learning.

These studies indicate that school policies and the mission of a school tend to affect teachers' beliefs about their competence as teachers. The studies also indicate that the influence of school policy on efficacy may be indirect.

Efficacy and students. As Metz (1988) illustrated in her interviews with teachers in different SES schools, teachers are dependent on students for feedback about effectiveness of

instruction. Bandura's (1977) ideas on social cognition suggest that how the feedback is interpreted depends on teacher attributions for student success or failure.

One factor that may influence teacher attributions is their conception of student intelligence. Dweck and Leggett (1988) suggest that people generally hold one of two different conceptions of intelligence, entity or incremental. An entity view of intelligence is a belief that intelligence is fixed. A person with this view tends to select social comparison goals in order to establish a ranking of themselves with their peers on particular tasks. For teachers, an entity conception of intelligence would lead them to attribute success or failure to students. An incremental conception of intelligence is the view that intelligence can change with practice and effort. A person with this view tends to select goals which allow for comparison with their own prior performance. For teachers, an incremental view of intelligence suggests that success or failure for students depends on how well a teacher does her/his job.

Although a person does not necessarily have only one view of intelligence, McNeil (1986) found that teachers in three different schools believed "... that the way a child is at present is the way he or she will always be." (p. 25)

Hypotheses

Based on the preceding discussion a model can be constructed which hypothesizes that a teacher's sense of efficacy is directly

affected by her/his perception of control over instruction in the classroom, indirectly affected by faculty influence on school instructional policy, and directly affected by their perception of student ability to learn. These ideas are illustrated in Figure 1. The arrows in the figure lead toward the center for simplicity in drawing, and because efficacy is considered to be a dependent variable in this study. This in no way implies that efficacy may not affect perceptions of control and/or students. Causality is difficult to demonstrate, so this study will focus on whether there is a relationship between efficacy and the constructs measured. It is up to later research to focus on whether any of the constructs actually cause efficacy.

Method

The Data Base

The data used in this study was from the High School and Beyond Program, specifically the Administrator-Teacher Survey (ATS) distributed in 1984. (For a description of ATS see Moles, 1988.) It was decided to use only the 343 public schools with the corresponding 7980 teachers and avoid the different social structures of private schools. To avoid the issue of missing data, case-wise deletion was used. The reduced sample used for the analysis consisted of 6178 teachers in 316 schools.

The sample was divided in half with one group consisting of schools with an even number identification code and the other group have odd number identification codes. The even number group

had 158 schools and 3154 teachers, and the odd number group had 158 schools and 3024 teachers. The two samples allowed for using one sample to test the model in Figure 1 and then checking the results with the remaining sample. The test sample was the even numbered schools and the validation sample was the odd numbered schools.

When the analysis was done on the test sample it was found that an estimated beta coefficient for one school was unusually small. The small size was the result of only five teachers being included in the sample, which affected the weighting of the beta coefficient. The school was deleted leaving 157 even numbered schools with their 3149 teachers.

Measures

Independent variables. Measures for the independent variables were created from items on the Teacher Survey. For those independent variables considered to be a school-level factor, a mean of teacher responses for a particular school was calculated and used in the analysis. A list of the independent variables and the items used to measure them are listed in the appendix.

Dependent variable. The dependent variable defining teacher sense of self-efficacy were constructed from two items on the Teacher Survey. (The items are listed in the appendix.) The items were selected on the basis of face validity with respect to the efficacy construct defined by Bandura.

Control variables. Several measures were constructed for control variables and added to the school-level analyses.

Control variables were selected on the basis that they offered explanations for the results other than the proposed model. For example, Anyon (1982) would suggest that the SES level of a school would affect how teachers perceive students. It is also possible that teacher beliefs about their control in the classroom, their belief about student ability, and their sense of efficacy is affected by the degree they believe student behavior is disruptive. It also may be that the number of students in a school may affects teacher beliefs. Therefore school SES, the number of students in a school, and faculty belief about student behavior were included as control variables in the school-level equations. The variables and their corresponding items are listed in the appendix.

Analysis

Testing the model consisted of starting out with the variables listed in Figure 1 and then including the control variables to determine the effect on the variance. Inclusion of control variables into the equations was based on the results of an option of the software package which used Bayesian statistics for predicting any change in variance accounted by a different model.

Since the model in Figure 1 suggests that a teacher's sense of efficacy is dependent on variables that are at the teacher-level (perception of students, control in the class) and at the school-level (faculty control), I chose to use a hierarchical linear model (HLM) for the analysis since it allows for multi-

level data. (For an example of the use of HLM, see Wong and Mason, 1985.)

Teacher-level analysis. For the teacher-level analysis the equations of interest were developed by looking at the relationships illustrated in Figure 1 and determining which focussed on the level of individual teachers. The mathematical representation of the relationships is

Self-Efficacy = A + (k) TPSA + (c) TPCC

where TPSA= Teacher Perception of Student Ability to learn

TPCC= Teacher Control in the Classroom.

The "constants" for the teacher-level equation, A, k and c, are determined by the school-level equations.

School-level analysis. The school-level equations for the analysis were determined from the relationship of the school-level factor (faculty influence over school instructional policy) to the two teacher-level factors. Control variables were added to limit alternative explanations of the results. The mathematical representations of the relationships are

A = FISP + DSB + SIZE

k = FISP + SES + DSB

c = FISP + DSB

where FISP = Faculty Influence over School Policy

SIZE = Number of Students in a School (control variable)

DSB = Disruptive Student Behavior (control variable)

SES = School Socio-economic Status (control variable).

Results

Analysis of test sample. The coefficients for the hierarchical linear model using the test sample data are shown in Table 1. The first thing to be noted is that the standard errors for the between level variables regarding faculty influence and disruptive student behavior are bigger than their respective gamma coefficients when used with teacher classroom control and teacher perception of student ability. Since gamma coefficients can be interpreted like regression coefficients, these results indicate we can not reject the hypothesis that faculty influence and student behavior have no effect on teacher classroom control and perception of student ability, when efficacy is the dependent variable.

Another important result is that we can not reject the hypothesis that teacher classroom control has no effect on teacher efficacy since the p-value (p=.271) indicates the gamma coefficient does not differ significantly from zero.

The results of the chi square test (shown in Table 2) indicate there is substantial unexplained variance in teacher efficacy using only perception of classroom control and perception of student ability (p=.186). This finding indicates the model, as a whole, does not work for test sample.

With respect to the school-level variables, while they may not affect teacher perception of classroom control or student ability ,

the significance of the t-statistics suggest faculty influence and student behavior do affect teacher efficacy (p=.002, p=.000, respectively).

Analysis of validation sample. The results of the analysis of the validation sample are shown in Table 3. While the results of the analysis with the validation sample agree with the results of the test sample analysis there are some interesting differences. The first is that the t-statistic for student behavior is statistically significant (p=.002) when it acts as a school-level factor affecting perception of student ability.

The second difference between the two analyses is that the base gamma coefficient for perception of classroom control for the validation sample is larger than the corresponding gamma coefficient for the test sample. It is also important to note that the p-value for the test sample gamma coefficient is not significant (p=.271) while the validation sample coefficient is modestly significant (p=.082).

The chi square test of the model (shown in Table 4) indicates that the teacher-level variables still do not account for a significant amount of variance in teacher efficacy. However the model did seem to work better for the validation sample than the test sample.

Discussion

Based on the analysis, the revised model is shown in Figure 2. The model indicates teacher efficacy is effected by teacher

beliefs about students' ability to learn, faculty influence over school policy, and faculty belief about student behavior.

While the model is only an initial step in understanding teacher efficacy, it does suggest how the context of a school may affect teacher beliefs and attitudes. Specifically the results suggest a factor in determining teachers' sense of efficacy is the behavior and attitudes of the students in the school. Metz's (1986) work with magnet schools extends this idea by suggesting teachers' beliefs may even be connected to the behavior of students taught in the past.

The results of the study also suggest that teacher efficacy may be related to the degree teachers are involved in school-level decisions regarding curriculum and student grouping for instruction. An area of future research should focus on how the two variables are related since high teacher efficacy and high involvement in a school may simply be the byproducts of a positive school culture (Little, 1982).

The results of the study also indicate there may be a relation between teacher control over classroom instruction and their sense of efficacy. The limited effect of this variable in the two samples may be a result of the lack of variation in the distribution of responses. However even with the narrow distribution the variable was a modest predictor in the validation sample. Perhaps we need to go back and try to define a measure of

teacher control over instruction that would show more variability across teachers.

A shortcoming of the study is the grouping of teachers in a school together. Work by Susan Moore Johnson (1988) suggests that teachers' perceptions of influence over school policy may vary by department, depending on access to resources and other factors. Therefore future research may need to look at within school variation, as well as variation across schools.

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Figure 1

Teacher Sense of Efficacy as an Instructional Leader and the School Environment

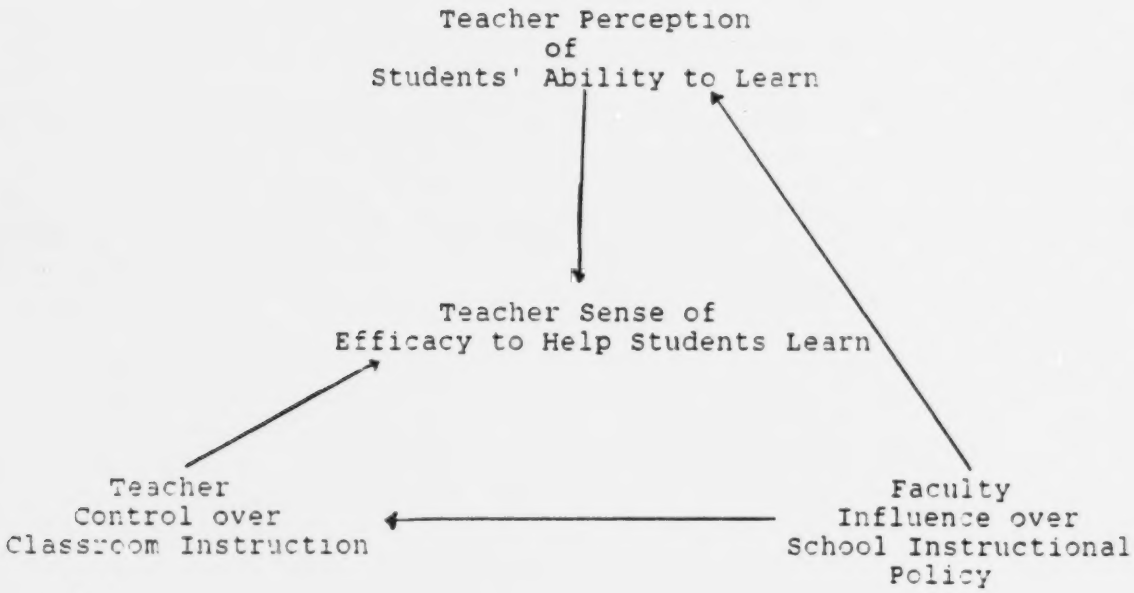

Teacher Perception of Students' Ability to Learn
Teacher Sense of Efficacy to Help Students Learn
Teacher Control over Classroom Instruction
Faculty Influence over School Instructional Policy

Table 1

The Gamma-Standard Error-T Statistic Table

for the Test Sample of Schools

	Gamma	Standard Error	T Statistic	p-value
FOR BASE COEF.				
BASE	5.30	.34	15.53	.000
FISP	.26	.08	3.17	.002
SIZE	-.0002	.0002	-1.51	.132
DSB	.30	.07	4.05	.000
FOR TPCC SLOPE				
BASE	1.52	1.38	1.10	.271
FISP	-.01	.37	-.03	.976
DSB	-.13	.30	-.43	.667
FOR TPSA SLOPE				
BASE	-.24	.08	-3.01	.003
FISP	-.001	.02	-.06	.951
DSB	.003	.018	.19	.851

FISP=Faculty Influence Over School Policy

SIZE=Number of Students in a School

DSB=Disruptive Student Behavior

Table 2

Chi Square Test of Variance Accounted for

in the Teacher Level Equation (Test Sample)

Parameter		Estimated Parameter Variance	Degrees of Freedom	Chi Square	P-value
BASE	COEF.	.13	153	283.65	.000
TPCC	SLOPE	.75	154	187.93	.032
TPSA	SLOPE	.002	154	169.51	.186

NOTE: THESE VALUES ARE BASED ON ONLY 157 OF 158 UNITS THAT HAD SUFFICIENT DATA FOR COMPUTATION

TPCC=Teacher Control in the Classroom

TPSA=Teacher Perception of Student Ability to Learn

Table 3

The Gamma-Standard Error-T Statistic Table

for the Validation Sample

		Gamma	Standard Error	T Statistic	p-value
FOR	BASE COEF.				
	BASE	4.73	.32	14.91	.000
	FISP	.37	.08	4.48	.000
	SIZE	.00006	.00006	1.02	.310
	DSB	.33	.06	5.13	.000
FOR	TPCC SLOPE				
	BASE	2.12	1.22	1.74	.082
	FISP	.058	.40	.15	.885
	DSB	-.35	.29	-1.21	.226
FOR	TPSA SLOPE				
	BASE	-.45	.07	-6.14	.000
	FISP	.002	.02	.09	.931
	DSB	.05	.02	3.26	.002

FISP=Faculty Influence over School Policy

SIZE=Number of Students in a School

DSB=Disruptive Student Behavior

Table 4

Chi Square Test of Variance Accounted for

in the Teacher Level Equation (Validation Sample)

Parameter		Estimated Parameter Variance	Degrees of Freedom	Chi Square	P-value
BASE	COEF.	.09	151	238.11	.000
TPCC	SLOPE	.43	152	164.08	.238
TPSA	SLOPE	.001	152	128.56	<.500

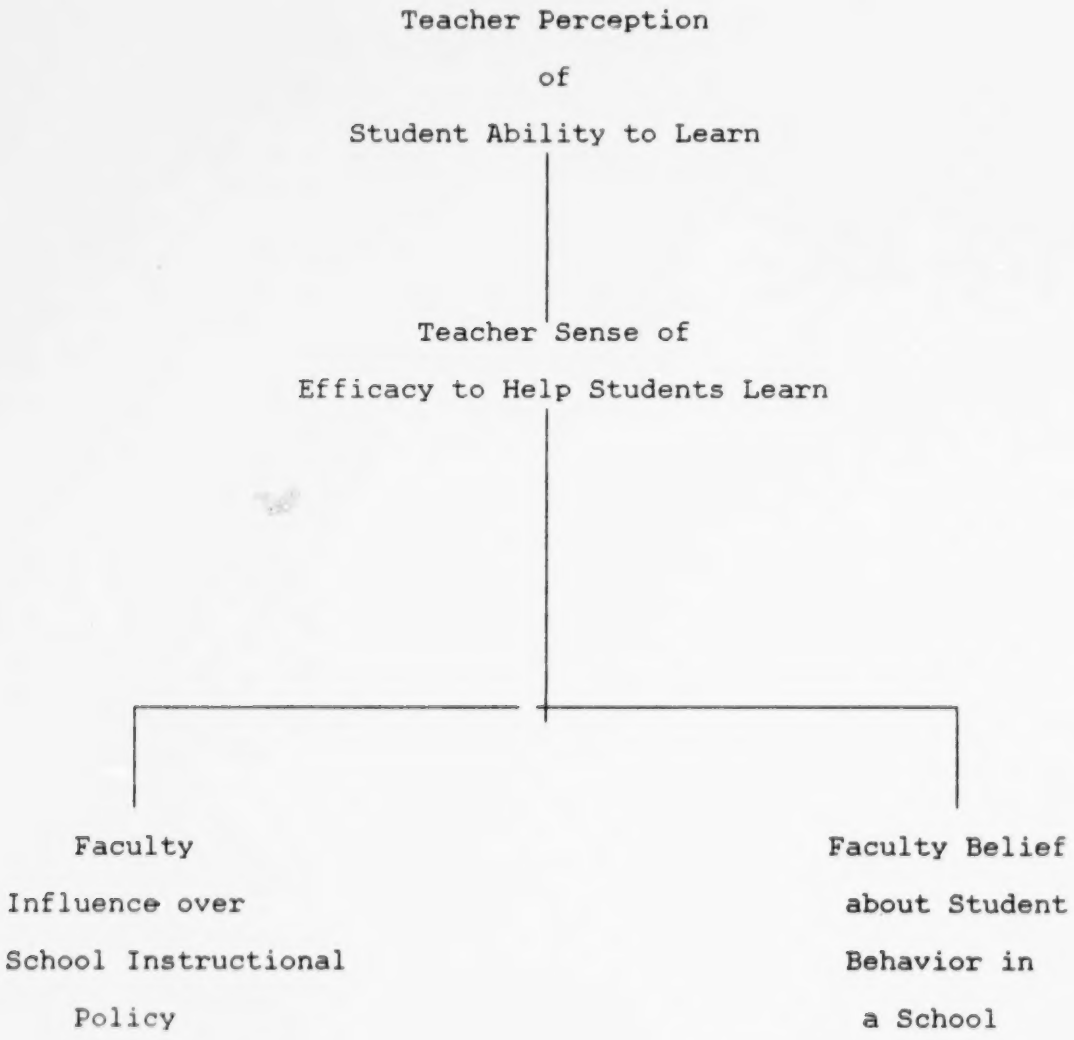
NOTE: THESE VALUES ARE BASED ON ONLY 155 OF 158 UNITS THAT HAD SUFFICIENT DATA FOR COMPUTATION

TPCC=Teacher Control in the Classroom

TPSA=Teacher Perception of Student Ability to Learn

Figure 2

Revised Model for Teacher Sense of Efficacy as an Instructional Leader and the School Environment



Faculty Influence Over School Policy

T1. How much do influence do teachers have over school policy in each of the areas below?

c. Setting policy on grouping students in classes by ability

d. Establishing the school curriculum

(The measure was the average of T1c and T1d, using the mean responses for each school.)

Teacher Belief about Control Over Classroom Instruction

T2. Using the scale provided, how much control do you feel you have <u>in your classroom</u> over each of the following areas of your planning and teaching?

a. Selecting textbooks and other instructional materials

b. Selecting content, topics, and skills to be taught

c. Selecting teaching techniques

(The measure was the sum of the three items, T2a, T2b, and T2c. The measure was also transformed using a natural log function to reduce skewedness of the frequency distribution.)

<u>Control Variables</u>

School Size

P62A. As of January 1, 1984 how many students were enrolled in your school in each of the following grades?

9th

10th

11th

12th

(The size measure was a sum of the four numbers.)

Appendix

Variables and Measures Used to Study Teacher Sense of Efficacy

Dependent Variable

Teacher Sense of Efficacy

T17. To what extent do you feel successful in providing the kind of education you would like to provide for most of your students?

(All T19 items started out with the phrase:

Using the scale provided, please indicate the extent to which you agree or disagree with each of the following statements.)

T19II. I sometimes feel it is a waste of time to try to do my best as a teacher.

(The measure was the sum of the two items.)

Independent Variables

Teacher Perception of Student Capability to Learn

(All T19 items started out with the phrase:

Using the scale provided, please indicate the extent to which you agree or disagree with each of the following statements.)

T19f. My success or failure in teaching students is due primarily to factors beyond my control rather than to my own effort or ability.

T19l. Many of the students I teach are not capable of learning the material I am supposed to teach them.

T19cc. The attitudes and habits my students bring to my class greatly reduce their chances for academic success.

(The measure was the sum of the three items.)

Disruptive Student Behavior

T19g. The level of student misbehavior (e.g., noise, horseplay or fighting in the halls, cafeteria or student lounge) and/or drug or alcohol abuse in this school interferes with my teaching.

(The measure was averaged across each school.)

Socio-Economic Status of the School

The initial measure was created by National Opinion Research Center and is part of the Sophomore First Follow-up Survey Data file created in 1982. The measure for this analysis was the mean student SES level for each school.